

Patent Application No. 10/707/910**FAX****RECEIVED
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MAR 24 2005****To:** Charles E. Philips, USPTO, and Art Unit 3751**FAX:** 571-273-8300**Phone:** 703-308-1515**Pages:** 7 pages including cover page**From:** Wilhelm A. Haberkorn**Signature:****Phone:** 912-598-8649**FAX:** 912-598-8668**Date:** March 23, 2005**Re:** Patent Application No. 10/707,910; Revision of previously submitted
DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS**DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS**

This invention overcomes numerous disadvantages and problems found within the prior art. The prior art can be classified into complex and simple devices. While such complex devices are typically very expensive to manufacture and such simple devices are relatively inexpensive to manufacture, there is a general lack of market acceptance for any of those devices which indicates additional problems. None of those devices require a set of process conditions within which to operate them. None require a projected cleaning space 13 within which cleaning of the genitals and posterior parts of the body can take place. None of the devices can be economically installed into all types of toilets, including flush tank and pressurized flush type toilets. None provide a device that operates with a cleaning fluid composed of multiple ingredients other than water. None provide an environmentally

friendly paperless toilet for use on boat toilets and other toilets operating in environmentally sensitive areas where sanitary system cannot handle the processing of toilet paper. None define a sanitary cleaning process for the device itself, whereby commercially available disinfectant and deodorizer fluids 16 are an integral part of the cleaning process. The detailed description of the preferred embodiments will address the aforementioned limitations and describe the solutions provided by the invention.

The preferred embodiment, shown in Figure 1, is one that uses an external cold water supply 25 and a external cleaning fluid housing 26 containing a pump 5, a heater 8, an anti-siphon valve 6, an electrical power source 21, a control wiring 21, and sufficient free volume to hold cleaning fluid. The said external housing 26 can be either foot mounted or wall mounted to fit the special requirements of its users. The external cleaning fluid housing 26 embodiment is particularly well suited for high frequency use installations; the cleaning fluid storage volume and its internal components, such as the cleaning fluid pump 5 and the cleaning fluid heater, can be sized to fit virtually all needs from extremely high usage at public facilities to low usage private use facilities. This device can be installed into a boat or RV to operate in an environmentally friendly manner.

The preferred embodiment uses an encapsulating housing for the above listed components in a configuration mountable to virtually any conventional toilet. Said encapsulating housing provides structure, esthetics and function for the various configurations implicit in this invention. Its design permits easy installation of the components arranged in the encapsulating housing via typically available two bolt toilet seat and lid mounts. The design can incorporate a replacement toilet seat and lid. Said encapsulating housing can be of materials that inhibit the growth of bacteria, thus improving its sanitary operating conditions. Said encapsulating housing is designed such that it incorporates sufficient thermal insulating properties to achieve acceptable thermal energy losses.

The preferred cleaning nozzles create either a single of stream of cleaning fluid or a plurality of streams of cleaning fluid toward the projected cleaning space. Either option is deemed acceptable for the effective functioning of the apparatus.

The preferred embodiment also utilizes a number of nozzle configurations that cater to user preferences by having replaceable nozzles containing different orifice sizes and orifice shapes, color coded nozzles, and cleaning nozzle connection that is indexed and a push-in type.

A further aspect of the preferred embodiment is the incorporation of a moving nozzle into the overall design. Moving the nozzle assembly into a non-use position by fully retracting away from a potentially feces accumulating position is deemed a very important issue. This is done to improve both, effectiveness and cleanliness of the apparatus. One of the nozzle movement configurations utilizes the cleaning fluid line pressure to facilitate said movement, achieving nozzle cleaning at the same time, while other viable options include solenoid and mechanical movement activation.

Maintaining sanitary conditions is one of the paramount issues of an effective operation of the preferred embodiments. The overall solution is one of incremental contributions of numerous parts, one of which is the activation of a sanitary cleaning cycle after every use, wherein a disinfectant and/or deodorizer is deposited onto the exposed nozzle surfaces. Another incremental contribution component is the use of a small portion of the cleaning fluid and diverting it to several diffusing cleaning fluid outlets for the purposes of cleaning exposed apparatus surfaces, while operating the posterior part cleansing nozzle. A further option is the positioning of said diffusing cleaning fluid outlets such that the resulting cleaning fluid flow is along the axis of the moveable portion of the posterior part cleansing nozzle assembly. Another incremental cleaning contribution is achieved by mechanically cleaning the nozzle assembly during its retraction movement. A further incremental improvement is the use of an apparatus cleaner cartridge integrated into the encapsulated housing and utilized in a post use apparatus cleaning cycle. A further option supporting the same objective is the use of a hand sprayer, either as integral part of the encapsulating housing, or provided via quick disconnect, allowing the user to address residual and extra-ordinary cleanliness problems.

A further enhancement of the overall encapsulated design is the addition of a bidet function provided through a second cleaning nozzle assembly. This addition is accomplished through mounting a nozzle assembly

parallel to said posterior part cleaning nozzle assembly with independent controls for its operation.

The compact design allows addition of cleaning fluid additives via easy exchange cartridges 17, 18, and 19. This addition represents a significant simplification in the operation of the apparatus for the user. Additives can be selected and simply installed by the user in their respective preferences.

Furthermore, such design can house a means to provide an air drying function via a heater, blower and plenum chamber distribution. Combining said air drying function with the use of an easy exchange air freshener cartridge improves the pleasantness of this necessary human process. Having an effective combination of a cleaning and drying process reduces toilet paper consumption to the point of not needing any toilet paper during and after the posterior part cleaning process. This is a significant improvement in decreasing the load on local waste processing plants and individual septic tank operations. Same is true for storing and processing effluent of boat's and RV's. Local ordinances in certain regions prohibit discharge of toilet paper containing effluent into surrounding water from boats, while toilet paper free discharges are still permitted in most regions.

Said functional operating components located inside said external cleaning fluid housing 26 consist of the following: A cleaning fluid pump 5 connected to a cleaning fluid pressure release valve 6, a means to pipe 11 said cleaning fluid to an externally located cleaning nozzle 7, and an electrical heater 8 that heats said cleaning fluid to a temperature ranging from 25°C to 50°C. Also residing inside said external cleaning fluid housing 26 is an electrical power 21 and a control wire connection 9 to said cleaning fluid pump 5 to and said electrical heater 8. A pressure sensitive switch installed under the toilet seat is used to prevent pump activation without the weight of a person sitting on the toilet. Said cleaning fluid pump 5 operates at a cleaning fluid pumping rate of 10 to 50 milliliters per second.

The operating duration of said cleaning fluid pump 5 is a) controlled by the user by means of an on/off switch 10 or b) set within the apparatus. The fluid rate is set by means of a mechanical or electrical controller within the said rate boundaries either set by the user during the use or set as a constant within the pump itself. The cleaning fluid temperature

is set at the heater by controlling the rate of electrical power consumption or cleaning fluid temperature using either open loop or closed loop controllers.

A fluid pressure release valve 6, residing within the external cleaning fluid housing 26, evacuates the cleaning fluid resident within the section from cleaning fluid pump 5 to cleaning nozzle 7 while providing three important functions. First, such valve interrupts the siphoning flow of the cleaning fluid after deactivating the cleaning fluid pump 5. Second, such valve provides a low level cleaning function for the contaminated cleaning nozzle 7. Third, such valve prevents cold cleaning fluid from being present at the beginning of next cleaning cycle.

A means, which pipes 11 cleaning fluid from the cleaning fluid pump 5 to a cleaning nozzle 7 mounted within the confines of a conventional toilet bowl 12, accommodates the cleaning fluid flow rates and cleaning fluid pressures and routes the cleaning fluid to the point of use, the cleaning nozzle 7. Said means to pipe 11 cleaning fluid is particularly configured for ease of installation and reliable operation.

Said cleaning nozzle 7 is mounted within the confines of a conventional toilet bowl 12 along its longitudinal axis at the back end of the toilet bowl 12 and below the rim of said toilet bowl 12. Said cleaning nozzle 7 is positioned within a well defined area defined by horizontal tolerance ranging from 30 to 150 millimeters below the rim of said toilet bowl 12 and vertical tolerance bound by plus/minus 80 millimeters from said longitudinal center line. Said cleaning nozzle 7 is mounted within 0 to 50 millimeters of the inner wall at the back end below the rim of said toilet bowl 12. Said nozzle is positioned in an upward angle that is defined by a projected cleaning space 13 and bound by an area created by the inside rim of said toilet bowl 12.

Said cleaning nozzle 7 creates a single diffused stream 14 of cleaning fluid directed toward said projected cleaning space 13, shown in Fig. 2, located within the confines of said toilet bowl 12; where, said projected cleaning space 13 is parallel to the area projected by the inside corner of the upper rim 15 of said toilet bowl 12, and said projected cleaning space 13 is centered in the rear half 27 of the toilet bowl 12 along the longitudinal center line 28 and segmented by the latitudinal center line 29 of the toilet bowl 12. Said projected cleaning space 13 is singular in any geometric shape 30 fitting within the confines of an oval 31,

centered in the rear half along the longitudinal axis of any conventional toilet bowl 12, wherein said oval is bound in the rear end of the toilet bowl 12 by the toilet bowl 12 rim. The maximum width of said boundary projected cleaning space 13 oval is 150 millimeters while its maximum length is 200 millimeters.

Another variation of the said cleaning nozzle 7 is a specific cleaning cycle for the cleaning nozzle 7 itself. This cycle is achieved by piping and depositing a disinfectant and deodorizer 16 onto the outer nozzle's surfaces 23 after every use to ensure sanitary conditions for the subsequent user. This cleaning process is achieved through the use of a parallel piping conduit 22 that terminates at the upper end of the nozzle mount in a manner that assures complete coverage of the outer nozzle's surfaces 23. The cleaning agent is located at the originating end of said conduit. A control circuit 24 automatically dispenses said cleaning agent after the nozzle is disengaged by the user. Readily commercially available toilet cleaning agents, such as DOW disinfectant bathroom cleaner, can be used as a cleaning agent for this purpose. The combination of a self-cleaning nozzle 7 and a disinfectant and deodorizer 16 will assure complete sanitary operation for every user.

Another embodiment of said cleaning nozzle 7 is one that creates a plurality of diffusing streams of cleaning fluid toward said projected cleaning space 13 of the various preferred geometric shapes.

While the present invention is described with reference to the preferred embodiments, it is in no way the intention to limit the invention to those embodiments but rather to include all modification, alterations and equivalent possible arrangements within the scope of the appended claims.